"EFFECT OF SINGLE PERIODIZATION TRAINING ON THE SELECTED PHYSICAL PARAMETERS OF THE COLLEGE VOLLEYBALL PLAYERS"

A
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INTRODUCTION

Scientific training has lot of importance and benefit in any sphere of education and physical education. Such training is plausibly important to enhance top performance in games and sports. Implementation of periodization for sportsmen is not new. Several researches indicate the impact of single periodization for better performance. Any training schedule has three phases viz., preparatory, competitive and transitional phase. If there is one preparatory phase one competitive phase and one transitional phase the training schedule is known as single per iodization.

It is often recommended that in-season training programs aim to maintain muscular strength and power developed during the off-season. However, improvements in performance may be possible with well- fitness and conditioning programs throughout the year. In particular, volleyball players are well- known to have one of the highest levels of strength training dedication. These elite athletes realize the benefits of a proper per iodized strength training program.

Volleyball pushes players to the extreme. Each athlete is expected to excel in explosive movements, vertical jumps, power hitting and intense serves. The position rotation in volleyball signifies the definite need for comprehensive players. Being a great blocker is a huge plus, but volleyball thrives off of all-around spectacular athletes. Strength training is a massive component to any elite athlete.

Strength training for volleyball requires the knowledge of periodization. Periodization means changing one or more variables within your strength training program on a regular and consistent basis. These variables can include the exercise, the frequency of lifting, the intensity of lifting, or the method of lifting.

History of volleyball

The game of volleyball, originally called “mintonette”, was invented in 1895 by William G. Morgan, after the invention of basketball by only 4 years. Morgan, a graduate of the Springfield College of the YMCA, designed the game to be a combination of basketball, baseball, tennis and handball.

The first volleyball net, borrowed from tennis, was only 6'6″ high (though you need to remember that the average American was shorter in the 19th century).The offensive style of setting and spiking was first demonstrated in the Philippines in 1916. Over the years that followed, it became clear that standard rules were needed for tournament play, and thus the USVBA (United States Volleyball Association) was formed in 1928.

Two years later, the first 2-man beach volleyball game was played, though the professional side of the sport did not emerge until much later. Not surprisingly, the first beach volleyball association appeared in California (1965), and the professional players united under the auspices of the AVP (American Volleyball Professionals) in 1983.

During the 1984 Los Angeles Olympics, American men and women took gold and silver medals in indoor volleyball competition. Four years later at the Olympics in Korea, the men once again scored gold. Starting in 1996, 2-man beach volleyball was officially introduced to the Olympics. Today, there are more than 800 million volleyball players worldwide, 46 million of them in the U.S.

Purpose of the Study

The purpose of this study is to see the effect of single periodization training on the selected physical parameters of the college male and female Volleyball players from western region of Maharashtra.

STATEMENT OF THE PROBLEM

The importance of training for Volleyball is not to build big muscles since they are rarely equated with improvements in power. On the contrary, strength coming should be viewed as an important ingredient for developing physiological needs for volleyball in order to improve a performance as such strength training does not have to be developed independently from other abilities. (i.e. reactive, power endurance) or in disregard of the planned training phases leading to champions or leaguer games.

In order to make strength a valuable physiological ingredient, it has to be trained in such a way that gains in strength lead to the highest levels of jumping power and be effectively applied during the game. In order to achieve this, strength training has to be structured into training

phases leading into the competitive phase. If during games strength gains are not effectively used to produce peak performance, the whole exercise is useless regardless of the size of the muscles.

To develop the skill required to exhibit better performance in competitive volleyball, single periodization training on the selected physical parameters training volleyball players has gaining lot of importance. Research studies show that periodization training enhances performance of volleyball players during competition. But its effect on physical parameters has not been explored. Therefore, the researcher of this study has selected this problem to see the effect of single periodization training on the selected physical parameter in volleyball players.

DELIMITATION OF THE STUDY

The research has delimited the study as follows:

- This is an experimental research and has been confined to volleyball only.
- Although there are many training methods available this study was limited to single perodization specially for college level volleyball players from western region of Maharashtra.
- This study was delimited to the male and female volleyball players of age group 17 to 27 years.

LIMITATIONS OF THE STUDY

While conducting this study, the researcher recorded some draw backs/ limitations as follows:

- The researcher could not control the diet and other psycho-social conditions, which might have influenced the results.
- Since the players were belonging to different culture and socio- economic background, the researcher could not consider this while planning the content of the experimental intervention.
- Number of subject in each group was less, which might have deviated the result.

OBJECTIVES OF THE STUDY

This study was conducted with the following objectives in Perspective.

- To assess the level of physical parameters of college level male volleyball players.
- To assess the level of physical parameters of college level female volleyball players.
- To Prepare proper training schedule, considering the principles of single peridization, for improving selected physical parameter of volleyball players that are required for the game.
- To see the effect of single periodization training and parametric training on physical parameter of the college level male and female volleyball players.

HYPOTHESES

On the basis of literature available so far it was hypothesized that:

H_1 : The physical parameters of selected volleyball players would be improved during preparatory phase of single periodzation.

H_2 : The physical parameters training of selected volleyball players would be improve during competitive phase of single periodzation.

H_3 : The physical parameters of selected volleyball players would be reduced during transitional phase of single periodzation.

H_4 : The physical training may be effective to enhance the Selected physical parameters that are required to perform Competitive volleyball.

OPERATIONAL DEFINITIONS OF TERMS USED

Single Periodization

Any training schedule has three phases viz. preparatory, competitive and transitional phase. If there is one preparatory phase, on competitive phase and one transitional phase the training schedule is known as single periodization.

Training Programme

Training program refers to the acquisition of knowledge, skills and competencies as a result of the teaching of vocational or training skills and knowledge that related to specific useful skills. Physical training is more mechanistic planned suites of regimes develop specific skills or muscles with a view to peaking at a particular time.

SIGNIFICANCE OF THE STUDY

The study would be significant in following ways:

- The periodization training programme evolved from this study may give idea to the coaches and physical education teachers to attain top of players performance.
- The physical education teacher and concerned professional can get a readymade periodization training schedule for volleyball players.

REVIEW OF LITERATURE

The researcher of this has done extensive review to find out the related literature in various libraries as well as he has gone through various websites. The relevant studies found by the research scholar are enumerated in this chapter.

Sheppard, Gabbett and Borgeaud (2008) evaluated the effect of repeated lateral movement and jumping training on repeated effort ability in a group of national team male volleyball players. Methods: Twelve volleyball players were assessed on their volleyball-specific repeated movement and jumping abilities using a volleyball specific repeated effort test (RED) before and after 12 weeks of training. The athletes performed between 8 and 9 volleyball training sessions per week, with 5 to 6 these sessions including specific training aimed at improving repeated effort ability. Typically these training sessions involved 8 to 12 repetitions of 2 to 3 block over a 9-m lateral distance (ie, the athletes had to perform jumps and lateral movements, typical of front court play in volleyball). Population- specific repeatability date were used to determine whether any changes that may have occurred in this study were beyond the minimal clinically important difference (MCID) for this testing procedure. Results: Improvements in all variables in the RET were observed for each athlete involved in the study, with a small -to-moderate magnitude observed for the mean changes in each variable (Cohen's d, 0.21 to 0.59). All of the improvements in the results exceeded the MCID. Conclusions: These findings demonstrate that the RET is sensitive to training-induced changes. Lateral movement speed and repeated lateral movement speed, as well as jumping and repeated jumping ability are trainable qualities in high performance volleyball players.

Gabbett (2008) investigated the specificity the specificity of skill-based conditioning games and compared the effectiveness of skill- based conditioning game and instructional training for improving physical fitness and skill in junior elite volleyball players. Twenty-five junior volleyball players (mean age +/ -SE, 15.6+/- 0.1 years) participated in this study. Heart rate data were collected on all players during the Australian Junior Vollyball Championships. After the competition, players were randomly allocated into a skill based conditioning games group (n=12) or an instructional training group (n=13). Each player participated in a 12 week training program that included 3 organized court training sessions per week. No significant differences ($p > 0.05$) were detected between competition and skill- based conditioning games for the percentage of time spent in low- intensity, moderate-intensity, and high-intensity

activities. Skill-based conditioning games induced improvements in vertical jump, spike jump, speed, agility, upper- body muscular power, and estimated maximal aerobic power, whereas technical instruction improved only spike jump and speed. Conversely, instructional training induced meaningful improvements in all measurement of skill, whereas improvement in technical skill. After skill based conditioning games were uncommon and typically small. The results of this study show that skill-based conditioning games offer a specific training stimulus to simulate the physiological demands of competition in junior elite volleyball players. Although the improvements in physical fitness after training were greater with skill-based conditioning game, instructional training resulted in greater improvement in technical skill in these athletes. These findings suggest that a combination of instructional training and skill-based conditioning of games is likely to confer the greatest improvements in fitness and skill in junior elite volleyball players.

Pereira et al., (2008) conducted as study with the purpose to determine a resting interval between countermovement jumps (i.e., volleyball spikes) that allows the maintenance of maximal jumping performance. Ten male volleyball players (1.85+/-0.05m, 77.2+ /- 10.6 kg, 21.6 +/-5.3 years) performed 6 experimental jumping sessions. In the first and sixth sessions, maximal countermovement jump height was measured, followed by submaximal countermovement jumps to the point of volitional fitgue. The number of countermovement jump was used as a reference to test the effect of rest period between volleyball spikes. From the second to fifth experimental sessions, 30 maximal volleyball spikes were performed with different resting periods (i.e., 8,14,17 and 20 seconds) followed by countermovement jumps. Between the 15^{th} and 30^{th} spike, the blood lactate concentration and heart rate were measured. Because the performance on the first and sixth sessions was the same, no training effects were noticed. During the 8-second resting interval set, the lactate concentration increased significantly between the 15^{th} and 30^{th} spikes (i.e., from 3.37 +/- 1.16 mmol to 4.94 +/- 1.49 mmol) the number of countermovement jumps decreased significantly after spikes compared to those performed without a previous effort (i.e., from 23+/-7 jumps to 17 +/-9 jumps) and these variables were significantly correlated (r =-0.7). On the other hand, the lactate concentration and number of countermovement jumps were stable across the other resting intervals, without a heart rate steady state. The result indicate that an adequate resting period between spikes allowed participants to achieve a lactate steady state in which the performance was maintained during the

exercise. These findings show that resting intervals between 14 and 17 seconds, typical during volleyball matches, are indicated to use in volleyball spike drills due to their due to their capacity to maintain maximal jumping performance.

Newton, Kraemer and Hakkinen (1999)determined whether ballistic resistance training would increase the vertical jump. (VJ) performance of already highly jump athletes. Methods: Sixteen male volleyball players from a NCAA Division I team participated in the study. A Vertec was used to measure standing vertical jump and reach (SJR) and jump and reach from a three-step approach(AJR). Several types of vertical jump tests were also performed on a Plyometric Power System and a forceplate to measure force, velocity, and power production during vertical jumping. The subjects completed `the rests and were than randomly divided into two groups, control and treatment. All subjects completed the usual preseason volleyball on-court training combined with a resistance training program. In addition, the treatment group completed 8 WK of squat jump training while the control group completed squat and leg press exercises at a 6RM load. Both groups were retested at the completion of the training period. Results: The treatment group produced a significant increase in both SJR and AJR of 5.9+/ -3.1% and 6.3+/-5.1%. respectively. These increases were significantly greater than the pre- to postchanges produced by the control group, which were not significant for either jump. Analysis of the data from the various other jump tests suggested increased overall force output during jumping, and in particular increased rate of force development were the main contributors to the increased jump height. Conclusions: These results lend support to the effectiveness of ballistic resistance training for improving vertical jump performance in elite jump athletes.

Complex training has been recommended as a method of incorporating ply metric with strength training. Some research suggests that ply metric performance is enhanced when performed 3-4 minutes after the strength training set, whereas other studies have failed to find any complex training advantage when ply metric are performed immediately after the strength training portion of the complex. portion of the purpose to determine of if there is an optimal time for performed, Jensen and Ebben (2003) conducted a study with complex training and if there is an optimal time for performing ply metric after the strength training set. Subjects were 21 NCAA Division I athletes who performed a squats, and 5 trials of countermovement vertical jump at intervals of 10 seconds and 1,2,3 and 4 minutes after the squat. Jump height and peak ground reaction forces were acquired via a force platform. The pre-squat jump performance was

compared was compared with the post-squat jumps. Repeated measures ANOVA determined a difference (p</=0.05) between genders and that jump performance immediately following the squat exercise was hindered (0.66 m), but not effect (p> o.o5) was found comparing subsequent jumps (0.72-0.76 m) to the pre-squat exercise was found comparing subsequent jumps (0.72-0.76 m) to the pre-squat condition (0.74 m). when comparing high to low strength individual, there was no effect on jump performance following the squat (p>o.o5). In conclusion, complex training does not appear to enhance jumping performance significantly and actually decreases it when the jump is performed immediately following the strength training set; however, a nonsignificant trend toward improvement seemed to be present. Therefore to optimize jump performance it appears that athletes should not perform jumps immediately following resistance training. It may be possible that beyond 4 minutes of recovery performance could be enhanced; however, that was not within the scope of the current study.

Hakkinen (1993) conducted a study to see the changes in physical fitness profile in female volleyball team served as experimental subjects in order to examine changes in a physical fitness profile during the competitive season consisting of a first season (I) for 10 weeks followed by season II for 11 weeks. The entire season was characterized by 4-5 weekly session for playing drills and competitive games and by 2-3 weekly sessions for physical conditioning mostly for strength and explosive strength training. The control group consisted of eight other female volleyball players who trained for physical conditioning during the competitive season 1-2 times per week. The present findings showed that the entire competitive season in experimental subjects led to no changes (from 47.3+/- 1.7 to 48.1+/- 3.4 ml x kg-1 x min-1) (n.s.) in VO2max but a significant (p<0.05) decrease took place in average power in a 30 s anaerobic jumping test. Significant increases took place in the maximal vertical jumping heights in the movement vertical jumping heights in the squat (from 30.3 +/-1.7 to 31.6 +/- 1.3 cm) (p<0.05) as well as in the spike and block jumps (p< 0.05) during competitive season I.

Marques and Gonzalez-Badillo (2006) investigated the change in bhysical paramerers produced during an in-season resistance training (RT) and detraining (DT, or RT cessation) in 16 high level team handball players (THPs). Apart from normal practice sessions, THPs underwent 12 weeks of RT. Subjects performed 3 sets of 3-6 reps with a load with a load of 70-85% concentric 1 repetition maximum bench press (1 RMBP), 3 sets of 3-6 reps with a load of 70-95% of repetition maximum bench press (1RMBP), 3 sets of 3-6 reps with a load of 70-95% of 4

repetition maximum parallel squats (4RMPS), plus vertical jumps and sprints. The 1RMBP, 4RMPS, speed over 30 m (s30), jump (countermovement jump height [CMJ]; CMJ with additional weights [20kg and 40kgl], and ball throw velocity (BTv) were tested before the experimental period (T1), after 6 weeks (T2), and after the 12- week experimental period (T3). Immediately after these 12 weeks, THPs started a 7-week DT period, maintained normal practices. The CMJ and the BTv were the only parameters evaluated during DT. The most important gains ($p < 0.001$) in s30 were obtained between T1-T2 and T1-T3. The BTv improved significantly ($p<0.001$) in jumping performance took place between T1-T2 and T1-T3. The 1RMBP increased significantly between all testing trials. After the DT, THPs can optimize important physical parameters over 12 weeks in-season and that 7 weeks of Dt, although insufficient to produce significant decreases in CMJ, are sufficient to induce significant decreases in BTv. It is concluded that after RT cessation THPs reduced BTv performance.

The effect of surgery on patellar tendinopathy (jumper's knee) is questionable, and conservative treatment protocols have not been properly documented. Therefore, Visnes et al., (2005) investigated the effect of a newly developed eccentric training program for patellar tendinopathy in volleyball players during the competitive season. Study Design: Randomized clinical trial. Methods: Patients were recruited from male and female elite volleyball teams in Norway, and the diagnosis was based on clinical examination alone. Of 51 players diagnosed with patellar tendinopathy, 29 could be included in the study. The training group (n=13) performed squats on a 25 degrees decline board as a home exercise program (3 x 15 repetitions twice daily) for a 12- week intervention period during the final half of the half of the competitive season. The eccentric (downward) component was done on the affected leg. The control group (n=16) trained as usual. The primary outcome was a symptom-based questionnaire developed specifically for patellar tendinopathy (Victorian Institute of Sport Assessment score), and patients were followed up before and after the intervention period, as well as after 6 and 30 weeks. All subjects self-recorded training to document their activity level (eccentric training, volleyball training, matches, other training). Results: There the intervention period in the training (pre, 71.1 +/- 11.3; post, 70.2 +/- 15.4) or control group (pre, 76.4 +/- 12.1; post, 75.4 +/- 16.7), nor was there any change during the follow-up period at 6 weeks or 6 months. The training during completed 8.2 +/- 4.6 weekly sessions of eccentric training during the intervention period (59% of the recommended volume), and there was no difference between groups in training or

competition load. Conclusion: There was no effect on effect on knee function from a 12-week program with eccentric training among a group of volleyball players with patellar tendinopathy who continued to train and compete during the treatment period. Whether the training would be effective if the patients did not participate in sports activity is not known.

Bayios et al., (2006) conduced a study with the aims a) to determine the anthropometric profile, body composition and somatotype of elite Greek female basketball (B), volleyball (V) and handball (H) players, b) to compare the mean scores among sports among sports and c) to detect possible differences in relation to competition level. Methods: A total of 518 female athletes, all members of the Greek first National League (A1 and A2 division) in B, V and H sport teams participated in the present study. Twelve anthropometric measures required for the calculation of body composition indexes and somatotype components were obtained according to the established literature. Results: V athletes, were the tallest ($p < 0.001$) among the three groups of athletes, had the lowest value of body fat ($p<0.001$) and their somatotype was characterized as balanced endomorph (3.4-2.7-2.9). B athletes were taller ($p<0.01$) and leaner ($p<0.001$) than H players, with a somatotype characterized as mesomorph-endomorph (3.7-3.2-3.2.4). B athletes were the tallerl ($p<o.o1$) and leaner ($p<0.001$) than H player with a somatotype characterized as mosomorph-endomorph (3.7-3.2-2.4) H athletes were the shortest of all ($p<0.01$), had the highest percentage of body fat ($p<0.001$) and their somatotype was mesomorph-endomorph (4.2-4.7-1.8) In comparison with their A2 counterparts the A1 division players were taller ($p<0.001$) and heavier ($p<0.01$), but at the same time leaner ($p<0.001$), and exhibited higher homogeneity in somatotype characteristics ($p<0.05$). Conclusions: Anthropometric, body composition and somatotype variables of Greek female elite teamball players varied among sport; selection criteria, hours of training and sport-specific physiological demands during the game could explain the observed differences. More data are certainly needed to define the anthropometric profile of B,V and H female athletes internationally.

Duncan, Woodfield and al-Nakeeb (2006) investigated the anthropometric and physiological characteristics of junior elite volleyball players. Method: Twenty five national level volleyball players (mean (SD) age 17.5 (0.5) years) were assessed on a number of physiological and anthropometric variables. Somatotype was assessed using the Heath-Carter method, body composition (% body fat, % muscle mass) was assessed using surface

anthropometry, leg strength was assessed using a leg and back dynamometer, low back and hamstring flexibility was assessed using the sit and reach test, and the vertical jump was used as a measure of lower body power. Maximal oxygen uptake was predicted using the 20 m multistage fitness test. Results: Setters were more ectomorphic ($p<0.05$) and less mesomorphic ($p<0.01$) than centres. Mean (SD) of somatotype (endomorphy, mesomorphy, ectomorphy) for setters and centres was 2.6 (0.9), 1.9 (1.1), 5.3 (1.2) and 2.2 (0.8), 3.9(1.1), 3.6 (0.7) respectively. Hitters had significantly greater low back and hamstring flexibility than opposites. Mean (SD) for sit and reach was 19.3 (8.3) cm for hitters. There were no other significant differences in physiological and anthropometric variables across playing positions (all $p>0.05$). Conclusion: Setters tend to be endomorphic ectomorphs, hitters and opposites tend to be balanced ectomorphs, whereas centres tend to be ectomorphic mesomorphs. These results indicate the need for sports scientists and conditioning professionals to take the body type of volleyball players into account when designing individualized position specific training programmes.

The literature presented above indicates the availability of ample of researches on the effect of various strategies of training on various aspects of volleyball game. Although there are many studies showing different periodized training intervention but there are very few studies which slow its effect on selected physical parameters of the Volleyball players especially residing in Maharashtra (India). Thus, the present study seems to be justified.

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